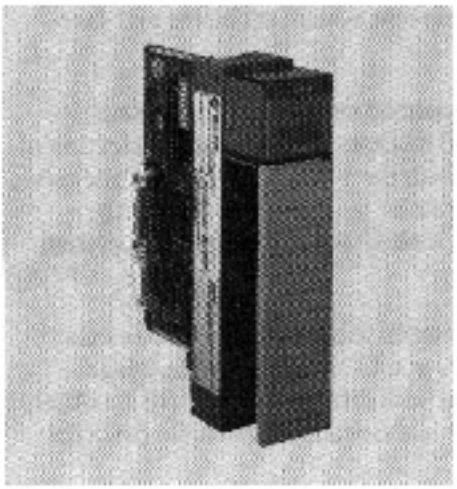
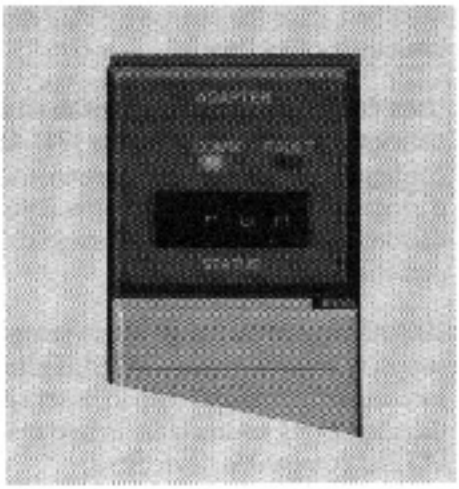
Rockwell Automation
Allen-Bradley

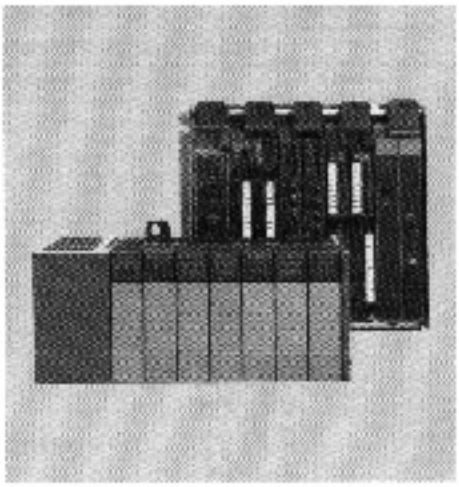
SLC 500™ Remote I/O Adapter Module

(Catalog Number 1747-ASB)

Product Data







Support remote I/O communications across the full line of 1746 discrete and analog products. The 1747-ASB Remote I/O Adapter Module provides a communication link between SLC™ or PLC® scanners and a wide variety of 1746 I/O modules. The 1747-ASB uses the time-tested Allen-Bradley RIO control link for remote I/O communications. This link allows for communication rates of up to 230.4K baud at 762 meters (2,500 feet) or for link distances to 3048 meters (10,000 feet) at 57.6K baud. Up to 32 different adapters can be configured on the RIO link using extended node capability.

Monitor three 7-segment displays for quick status information and troubleshooting help. Each 1747-ASB module features a status display that provides alphanumeric status of the 1747-ASB module, the 1746 I/O that it controls, and communication with the RIO system. When combined with the COMM and FAULT LEDs, this display is a very effective diagnostic tool.

Features and Benefits

Supports 1/2-slot, 1-slot, and 2-slot addressing modes. Provides efficient image utilization by allowing you to assign the amount of image space required per slot for your particular I/O configuration.

Provides switch selectable discrete or block transfer image mapping of speciality (e.g., analog) I/O modules. Selecting discrete mode provides deterministic data transfer and eliminates the need to program a command in your PLC, but potentially uses more image space. Block transfer mode conserves image space (1 byte of I/O image), but is not as deterministic and requires programming. The mode you select depends on your system requirements, specialty I/O module, and addressing mode.

Secures I/O and DIP switch configurations in non-volatile memory. A special feature implemented with a DIP switch allows you to inhibit operation of the 1747-ASB module if the I/O configuration or DIP switch settings were modified since the last save. This can prevent system problems and save troubleshooting time.

Uses the DIP switches to establish an expanded selection of operational settings and safeguards for the 1747-ASB module. The expanded selection of configuration settings available to you with the 1747-ASB module, including a processor restart lockout feature, discrete or block transfer mapping options, and selectable RIO image size, makes it easier to optimize system performance.

Maximizes scanner image space using complementary I/O. If your scanner supports complementary I/O, this allows you to assign the same image location to inputs and outputs associated with different 1747-ASB modules, thereby saving addressable image space in the scanner data table for other I/O and compatible devices.

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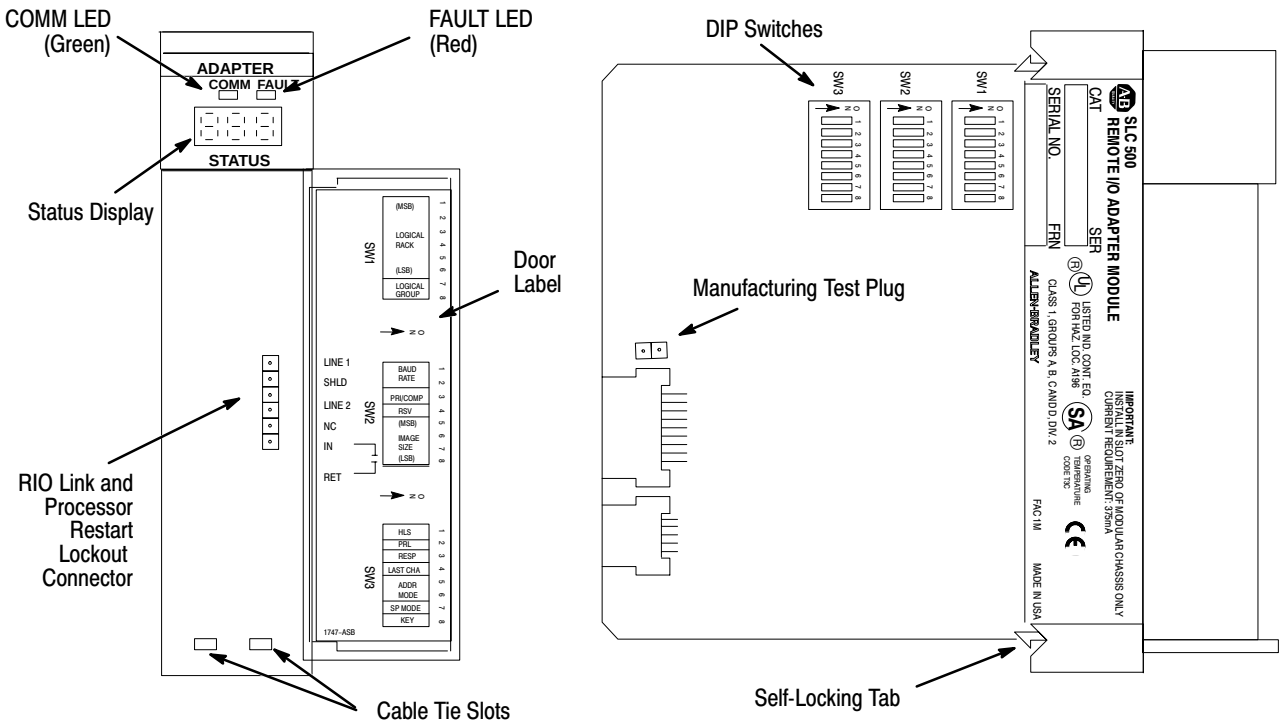
Hardware Overview

Hardware features significant to installing, configuring, and troubleshooting the 1747-ASB module are described in the table and located in the following illustration.

Hardware Features

Hardware	Function
COMM LED	Displays communication status
FAULT LED	Displays operating status
Status Display	Reveals status message data
Door Label	Provides module configuration and wiring information
RIO Link and Processor Restart Lockout Connector	Provides physical connection to RIO link and processor restart lockout switch
Cable Tie Slots	Secure and route wiring from module
DIP Switches	Establish configuration parameters for the module
Test Plug	Used for manufacturing purposes only
Self-Locking Tabs	Secure module in chassis slot



System Overview

The 1747-ASB module is a single-slot, RIO communication link module. It occupies the first slot (slot 0) of a 1746 remote chassis, where the SLC processor normally resides.

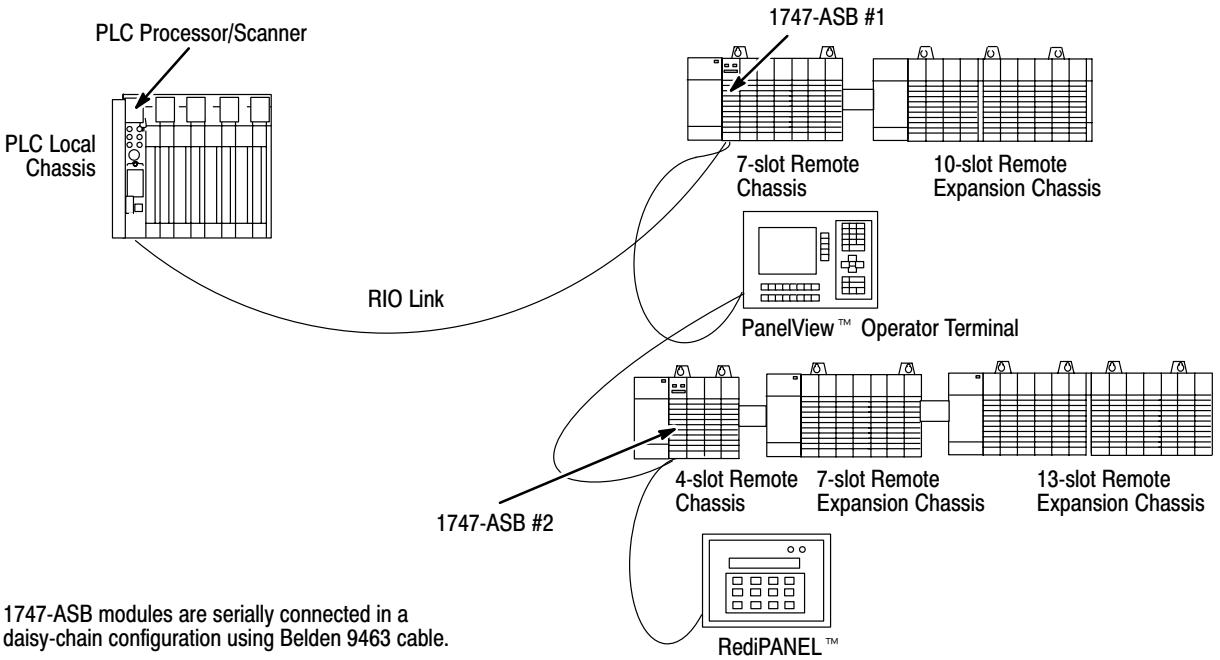
The 1747-ASB module is an adapter, or slave, on the RIO link and master of the remote chassis and remote expansion chassis where it resides. It can control up to 30 slots of I/O installed in up to three 1746 chassis. It acts as a gateway between a PLC or SLC system scanner and the I/O modules in the 1747-ASB remote chassis and remote expansion chassis.

Output data is sent from the system scanner to the 1747-ASB module across the RIO link. It is automatically transferred to the output modules across the chassis backplane. Inputs from the input modules are collected across the backplane by the 1747-ASB module and sent back to the scanner across the RIO link. No user programming of the 1747-ASB module is necessary.

Typical PLC to 1747-ASB Configuration

In this illustration the PLCs built-in scanner controls two 1747-ASB modules. 1747-ASB #1 controls one 7-slot and one 10-slot 1746 chassis, and 1747-ASB #2 controls one 4-slot, one 7-slot, and one 13-slot 1746 chassis. A single 1747-ASB module can control up to three 1746 chassis or 30 slots.

Scanner	Adapter	I/O Modules
PLC	1747-ASB #1	Controls up to 16 compatible I/O modules
	1747-ASB #2	Controls up to 23 compatible I/O modules

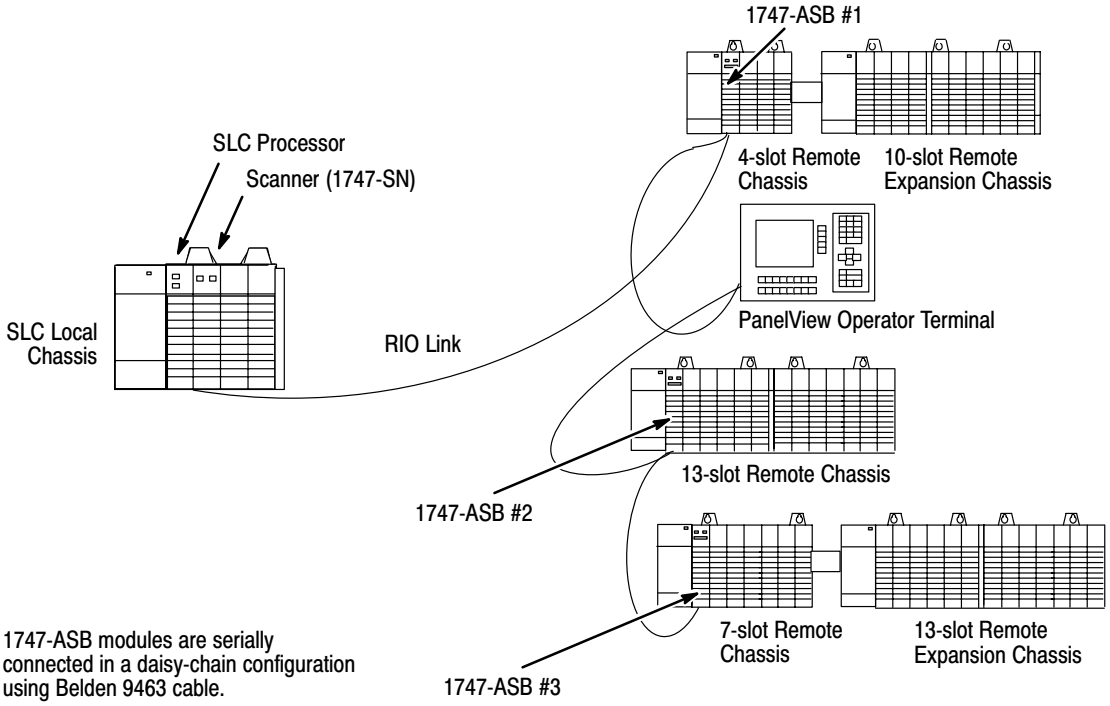


1747-ASB modules are serially connected in a daisy-chain configuration using Belden 9463 cable.

Typical SLC to 1747-ASB Configuration

In this illustration the 1747-SN RIO scanner resides in the second slot (slot 1) of the local chassis and controls three 1747-ASB modules. 1747-ASB #1 controls one 4-slot and one 10-slot chassis. 1747-ASB #2 controls one 13-slot chassis. 1747-ASB #3 controls one 7-slot and one 13-slot chassis.

Scanner	Adapter	I/O Modules
SLC	1747-ASB #1	controls up to 13 compatible I/O modules
	1747-ASB #2	controls up to 12 compatible I/O modules
	1747-ASB #3	controls up to 19 compatible I/O modules

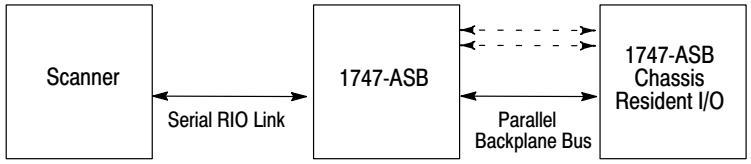


System Operation

When power is applied to the 1747-ASB it automatically determines which I/O modules you installed in its chassis and configures its own image table according to the DIP switch settings you set before installation. If a valid configuration has been set, operation will begin.

You make selections for starting logical rack, starting logical group, image size, and slot addressing mode. For example, slot addressing refers to how each chassis slot is assigned a specific amount of the 1747-ASB I/O image. The amount depends on which addressing mode you choose: 1/2-slot, 1-slot, or 2-slot addressing. Typical uses of the different modes are shown in the following table.

Addressing Mode	Typically used with these modules:
1-Slot Addressing	4, 8, or 16 point discrete I/O modules; specialty I/O modules
2-Slot Addressing	4 or 8 point discrete I/O modules; specialty I/O modules
1/2-Slot Addressing	4, 8, 16, or 32 point discrete I/O modules; specialty I/O modules



- Built-in (PLC)
- Modular (PLC or SLC)

- Discrete Mode
- Block Transfer Mode

- Discrete I/O Modules
- Analog I/O Modules
- Other Specialty I/O Modules

Inputs from I/O resident in the 1747-ASB chassis are gathered by the 1747-ASB module in a single SLC backplane input scan. These inputs are then transmitted from the 1747-ASB to the scanner on the RIO link using RIO discrete transfers and/or RIO block transfers.

Outputs intended for I/O modules resident in the 1747-ASB chassis are sent by the scanner on the RIO link to the 1747-ASB using RIO discrete transfers and/or RIO block transfers. These outputs are then transmitted to the appropriate I/O module in a single SLC backplane scan.

RIO discrete transfers are transparent to a user. RIO block transfers are initiated by instructions added to the PLC ladder logic program. RIO block transfers are used when large amounts of data must be exchanged.

Compatible Modules

RIO Scanners

The 1747-ASB module is compatible with all Allen-Bradley scanners. Scanners that do not support RIO block transfers do not work with all of the I/O modules supported by the 1747-ASB module. For example, the 1747-SN Series A, RIO Scanner, does not work with the 1746-BAS, BASIC Module, since the scanner does not support RIO block transfers.

Refer to the appropriate scanner manual for details concerning physical and logical specifications.

Compatible Scanners

Catalog Number	Device	Extended Node Capability	Comments
1771-SN	Sub I/O Scanner for Mini-PLC-2® and PLC-5® families	No	Revision D or later
1772-SD, -SD2	Remote Scanner/Distribution Panel for PLC-2 family	Yes (except with SD-2 Series A)	SD-2 scanner must be Revision 3 or later.
1775-S4A, -S4B, -S5	I/O Scanner Programmer Interface Module for PLC-3® family	Only available with S5 scanner	–
1775-SR, -SR5	Remote Scanner Distribution Panel for PLC-3/10 family	Only available with SR5 scanner	–
1785-L11B	PLC-5/11™ (in scanner mode)	Yes	–
1785-LT/x	PLC-5/15™ (in scanner mode)	Yes	PLC-5/15 Series B Revision H or later have partial rack addressing. Earlier versions are limited to 3 logical devices.
1785-L20B	PLC-5/20™ (in scanner mode)	Yes	–
1785-LT2	PLC-5/25™ (in scanner mode)	Yes	PLC-5/25 Series A Revision D or later have partial rack addressing. Earlier versions are limited to 7 logical devices.
1785-L30x	PLC-5/30™ (in scanner mode)	Yes	–
1785-L40x	PLC-5/40™ (in scanner mode)	Yes	–
1785-L60x	PLC-5/60™ (in scanner mode)	Yes	–
5250-RS	Remote Scanner for PLC-5/250™	Yes	–
1747-SN	SLC Remote I/O Scanner	Yes	Series A scanner does not have block transfer capability.
6008-SI	IBM® PC I/O Scanner Module	Yes	–
6008-SV	VMEbus I/O Scanner Module	Yes	–
6008-SQH1, -SQH2	Q-bus I/O Scanner Module	No	–

RIO Adapters

The 1747-ASB Module can physically reside on the RIO link with any other adapter. The following table lists the adapters available for use with a RIO link.

Compatible RIO Adapters

Catalog Number	Device	Extended Node Capability	Comments
1785-LT/x	PLC-5/15	Yes	In adapter mode
1785-LT2	PLC-5/25	Yes	In adapter mode
1785-LT3	PLC-5/12™	Yes	In adapter mode
1785-L30x	PLC-5/30	Yes	In adapter mode
1785-L40x	PLC-5/40	Yes	In adapter mode
1785-L60x	PLC-5/60	Yes	In adapter mode
1771-ASC	Remote I/O Adapter Module	No	–
1771-ASB	Remote I/O Adapter Module	Series B and C only	Series A, B, and C
1771-AM1	1-Slot I/O Chassis with Integral Power Supply and Adapter	Yes	–
1771-AM2	2-Slot I/O Chassis with Integral Power Supply and Adapter	Yes	–
1784-F30D	Plant Floor Terminal Remote I/O Expansion Module	Yes	–
1771-RIO	Remote I/O Interface Module	No	–
1771-JAB	Single Point I/O Adapter Module	Yes	–
1771-DCM	Direct Communication Module	No	–
1778-ASB	Remote I/O Adapter Module	Yes	–
1747-DCM	Direct Communication Module	Yes	–
2706-xxxx	DL40 Dataliner™	Yes	Must be catalog number 2706-ExxxxxB1.
2705-xxx	RediPANEL	Yes	–
2711-xx	PanelView Terminal	Yes	–
1336-RIO	Remote I/O Adapter for 1336 AC Industrial Drives	Yes	–
1395-NA	Remote I/O Adapter for 1395 DC Industrial Drives	Yes	–
1747-ASB	SLC 500 Remote I/O Adapter Module	Yes	–

I/O Modules

The following modules can be placed in the 1747-ASB chassis:

Compatible I/O Modules ①

Catalog Number	Device	Comments
1746-xxx	All discrete I/O modules	–
1746-Nxx	All analog I/O modules	–
1746-BAS	BASIC Module	SLC 5/01 mode
1746-HS	IMC™ 110 Motion Control Module	–
1747-KE	RS-232/DH-485 Communication Interface Module	1 word input, 0 words output
1747-DSN	Distributed I/O Scanner	SLC 5/01 mode
1747-DCM	Direct Communication Module	–
1746-NT4	Thermocouple/mV Input Module	–
1746-NR4	RTD/Resistance Module	–

① The 1746-HSCE High-Speed Counter module is not compatible in a 1747-ASB remote configuration.

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Specifications

Description	Specification
Backplane Current Consumption	375 mA at 5V
Operating Temperature	32°F to 140°F (0°C to 60°C)
Storage Temperature	–40°F to +185°F (–40°C to +85°C)
Humidity	5% to 95% noncondensing
Noise Immunity	NEMA standard ICS 2-230
Agency Certification (when product or packaging is marked)	•CSA certified •CSA Class I, Division 2 Groups A, B, C, D certified •UL listed •CE marked for all applicable directives

Baud Rate Determination of Maximum Cable Length and Terminating Resistor Size

	Baud Rate	Maximum Cable Distance (Belden 9463)	Resistor Size
Using Extended Node Capability	57.6K baud	3048 meters (10,000 feet)	82Ω 1/2 Watt
	115.2K baud	1524 meters (5,000 feet)	
	230.4K baud	762 meters (2,500 feet)	
Not Using Extended Node Capability	57.6K baud	3048 meters (10,000 feet)	150Ω 1/2 Watt
	115.2K baud	1524 meters (5,000 feet)	
	230.4K baud	762 meters (2,500 feet)	82Ω 1/2 Watt

Performance

The 1747-ASB (Remote I/O) performance is determined by I/O module configuration (i.e., number and type of modules in chassis) and by remote system configuration (i.e., baud rate, number of 1747-ASB modules, PLC/Scanner, etc.). Refer to the Remote I/O Adapter Module User Manual, publication 1747-6.13, for more information.

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